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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 CHESTNUT BUILDING
PHILADELPHIA, PENNSYLVANIA 19107

SUBJECT: Off-Site Equipment Area Sampling Program **DATE:** 07/02/90

FROM: Lorie Acker
Sr. SIO

TO: Files Given Below

The document listed below contains information pertaining to all Texas Eastern Compressor Stations listed in CERCLIS. This document can be located in the file for **Texas Eastern - Connellsville PA-2167.**

"Off-Site Equipment Area Sampling Program, US EPA Consent Decree", Texas Eastern Gas Pipeline Company, Houston, Texas. June 1990

File to:

Texas Eastern Pipeline - Accident	MD-0271
Texas Eastern Pipeline - Armaugh	PA-2164
Texas Eastern Pipeline - Bechtelsville	PA-2169
Texas Eastern Pipeline - Delmont	PA-2159
Texas Eastern Pipeline - Entriken	PA-2155
Texas Eastern Pipeline - Grantville	PA-2156
Texas Eastern Pipeline - Holbrook	PA-2158
Texas Eastern Pipeline - Lilly Station	PA-2154
Texas Eastern Pipeline - Marietta Sta 24	PA-2157
Texas Eastern Pipeline - Marietta Sta 24A	PA-2162
Texas Eastern Pipeline - Perulack	PA-2163
Texas Eastern Pipeline - Phoenixville	PA-2168
Texas Eastern Pipeline - Rockwood Sta 22	PA-2165
Texas Eastern Pipeline - Shermansdale	PA-2153
Texas Eastern Pipeline - Uniontown Sta 21	PA-2160
Texas Eastern Pipeline - Windridge Sta 20	PA-2166
Texas Eastern Pipeline - Bedford	PA-2152
Texas Eastern Pipeline - Chambersburg Sta 23	PA-2170

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Texas Eastern Gas Pipeline Company

A DIVISION OF TEXAS EASTERN TRANSMISSION CORPORATION

June 1, 1990

Mr. Daniel Harmon
Engineering-Science, Inc.
57 Executive Park South, N.E.
Suite 590
Atlanta, Georgia 30329

RE: PENNSYLVANIA INITIAL GROUNDWATER DATA REPORT SUBMITTALS

Dear Mr. Harmon:

Enclosed please find six (6) copies of the Initial Groundwater Data Reports ("IGDRs") for the Connellsville (21), Rockwood (22), Chambersburg (23) and Eagle (25) Pennsylvania sites.

The IGDRs for the Rockwood (22) and Chambersburg (23) sites are being submitted pursuant Attachment A-A, Paragraph 2.3(a) of Appendix A of the Consent Decree which requires submittal of IGDRs for Exhibit L sites within 11 months after the effective date of the Consent Decree. The Connellsville (21) and Eagle (25) IGDRs are also being submitted at this time to complete Texas Eastern's submission of IGDRs for all Pennsylvania sites requiring IGDR submittals pursuant to Section IV.F.1 of Appendix A of the Consent Decree.

In accordance with Section I.C of Appendix A of the Consent Decree, Texas Eastern is submitting copies of each IGDR to EPA Region III and to the Pennsylvania Department of Environmental Resources.

Should you have any questions regarding this submittal, please contact me at (713) 759-5171 or Dan Podobinski at (713) 759-7629.

Sincerely,

R. A. Riess

R. A. Riess
Manager,
Environmental Services

RAR/AWC/aa
igdres.let

Enclosures

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INITIAL GROUNDWATER DATA REPORT
ROCKWOOD (22) SITE, PENNSYLVANIA

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Texas Eastern Gas Pipeline Company
Houston, Texas

INITIAL GROUNDWATER DATA REPORT
ROCKWOOD (22) SITE, PENNSYLVANIA

June 1990

Prepared by:

Roy F. Weston, Inc.
Weston Way
West Chester, Pennsylvania 19380

TABLE OF CONTENTS

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LIST OF FIGURES

LIST OF TABLES

SECTION 1

INTRODUCTION

1.1 PROGRAM OVERVIEW

On October 11, 1989, the United States District Court for the Southern District of Texas approved a Consent Decree between Texas Eastern Transmission Corporation and its division Texas Eastern Gas Pipeline Company ("Texas Eastern") and the United States Environmental Protection Agency ("EPA"). The purpose of the Consent Decree, in part, is to provide for the timely characterization of the probable nature and extent of polychlorinated biphenyls ("PCBs") and other selected substances at and adjacent to Texas Eastern sites. Appendix A, Section IV, of the Consent Decree addresses groundwater assessment activities and calls for a phased approach in conducting groundwater monitoring and sampling activities at Texas Eastern's sites.

Prior to entering into the Consent Decree, Texas Eastern initiated a groundwater monitoring and assessment program at 18 sites in Pennsylvania (Figure 1-1). Fourteen of these sites are active compressor stations. Texas Eastern performed this work in accordance with Paragraphs 4 through 9 and Paragraph 11 of the April 1, 1987, Consent Order and Agreement ("Pennsylvania Consent Order") between Texas Eastern and the Commonwealth of Pennsylvania Department of Environmental Resources ("Pennsylvania DER").

Because Texas Eastern's groundwater assessment activities were well underway in Pennsylvania when the Consent Decree was being negotiated, EPA's decision on the acceptability of this work was specifically included in the Consent Decree. EPA's decision, as documented in Appendix A, Attachment A-A, Paragraph 2.1 through 4, of the Consent Decree, was to: 1) accept the groundwater monitoring wells in place in Pennsylvania, 2) require additional groundwater monitoring wells or data collection at certain Pennsylvania sites where substances of concern had not been detected but where knowledge of the hydrogeological regime was in doubt, and 3) require Texas Eastern to perform those groundwater-related tasks that were part of the Consent Decree but not part of the Pennsylvania Consent Order.

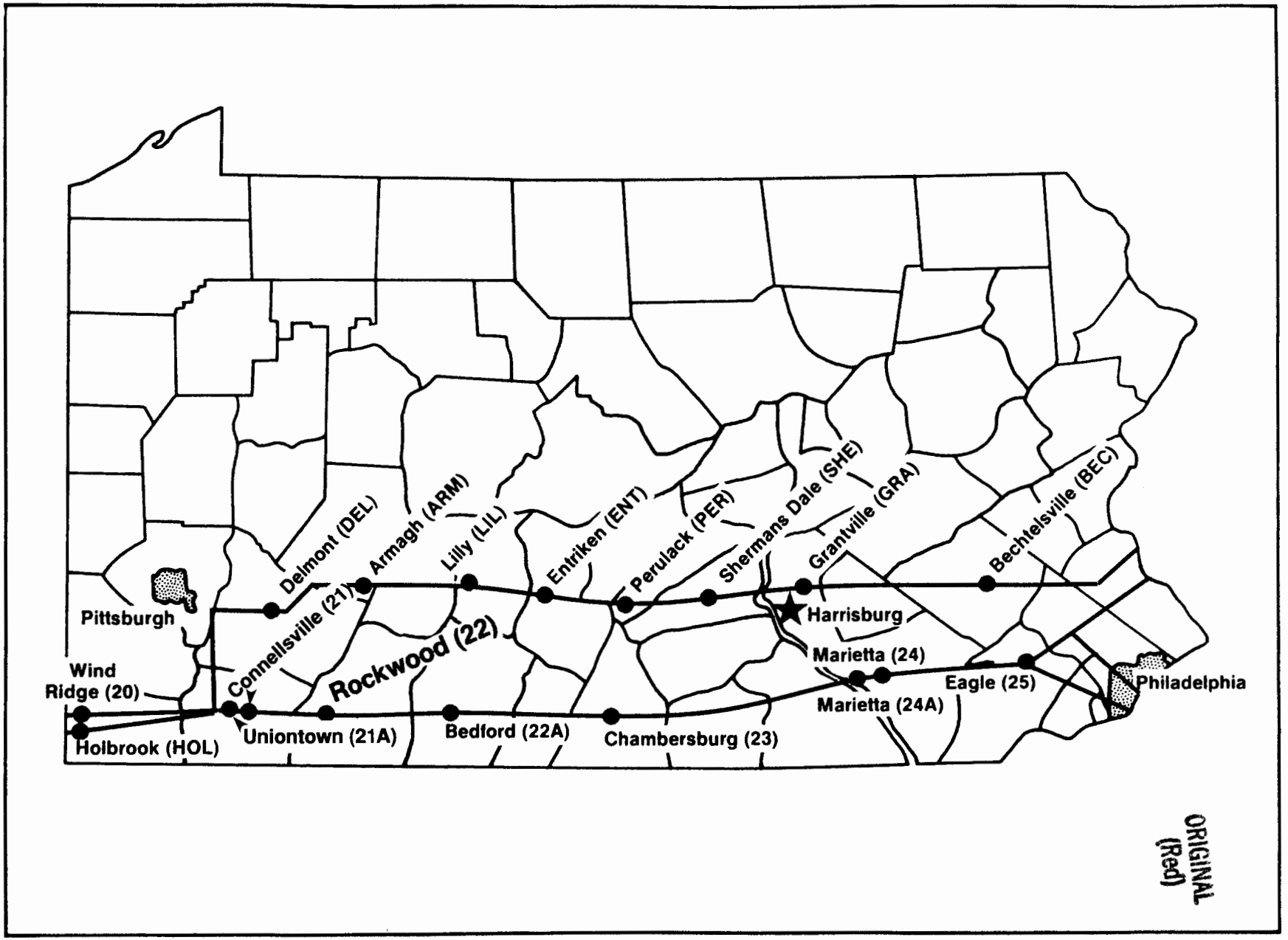

FIGURE 1-1 LOCATIONS OF THE PENNSYLVANIA SITES

In accordance with Appendix A, Attachment A-A, Paragraph 2.1, of the Consent Decree and with the completion of Exhibit L activities, EPA has concluded that, as specified in Texas Eastern's letter to the Pennsylvania DER dated May 25, 1988 ("Exhibit L" of the Consent Decree), spring SP-01 has been used as an additional downgradient monitoring location. The groundwater monitoring wells initially installed by Texas Eastern at the Rockwood (22) Station ("Site") satisfied the requirement to install pit monitoring well networks as specified in Appendix A, Section IV.C.1 through 4, of the Consent Decree.

The results of Texas Eastern's groundwater assessment program conducted at the Site from April 1987 through April 1988 were submitted to Pennsylvania DER in a Groundwater Assessment Program Survey Report ("GAPSR") dated November 1988.

Phase I of Texas Eastern's groundwater assessment effort consisted of installing and sampling upgradient groundwater monitoring well MW-01 and downgradient monitoring wells MW-02 and MW-03 to assess the quality of groundwater near War Emergency Pipeline (WEP) area PA-22-01. Pursuant to Exhibit L correspondence concerning additional groundwater actions at the Site, spring SP-01 was used as an additional downgradient sampling location. The Phase I groundwater monitoring program did not detect the presence of PCBs or other Hazardous Substances List (HSL) compounds above the quantitation limits specified in Appendix A, Attachment A-C, of the Consent Decree.

Appendix A, Attachment A-A, Paragraphs 2.3(a) of the Consent Decree requires that Texas Eastern prepare and submit to EPA a site-specific Initial Groundwater Data Report (IGDR) for the Rockwood (22) site within 11 months after the effective date of the Consent Decree (October 11, 1989). In accordance with Appendix A, Section IV.F.1 of the Consent Decree, the IGDR will include (a) the Section III site map, with upgradient and downgradient wells identified, (b) the Section IV.A hydrogeology review, (c) the well depths, (d) the water level data collected pursuant to Section IV.B, (e) boring logs, (f) a statement regarding the horizontal flow gradient of the uppermost aquifer, and (g) analytical data.

This document is the IGDR for the Rockwood (22) Site and presents a summary and review of the principal groundwater findings at the Site as of March 1, 1990.

A regional overview of the physical setting of the Site is presented in Section 2. A discussion of the Site groundwater investigation and analytical results of the Phase I groundwater monitoring activities is presented in Section 3. An assessment of the groundwater conditions at the Site is provided in Section 4. A summary of the groundwater assessment activities performed and conclusions are presented in Section 5. A reference list is provided in Section 6. Appendices follow the text, and attachments are located in the back pockets.

1.2 SITE LOCATION AND DESCRIPTION

The Rockwood (22) Site is located in south-central Somerset County, Pennsylvania, approximately one mile south of the town of Milford (Figure 1-2) and about 3.5 miles southwest of the town of Somerset. The area surrounding the Site is rural and is composed principally of open fields, farms, and woodlands. Many active and inactive underground coal mines, strip mines, and rock quarries are also located throughout the region. The Site is situated within the Allegheny Mountain section of the Appalachian Plateaus physiographic province (Flint, 1965). The topography is characterized by southwest-northeast trending ridges that bound broad valleys, which in some places have been deeply incised by streams.

The Site is situated on an open hillside with a gentle eastward slope. Elevations in the vicinity of the Site range from approximately 1,900 feet above mean sea level (MSL) at Coxes Creek less than 1 mile northwest of the Site to approximately 2,260 feet above MSL at the crest of the hill south of the Site (Figure 2-1). Relief on the Site is about 60 feet, with the lowest point in the eastern corner (elevation 2,180 feet above MSL) and the highest point in the southern corner (elevation 2,240 feet above MSL).

The Site occupies approximately 17 acres. A map showing the station layout and surface features surrounding the Site is provided in Attachment 1.

1.3 SITE HISTORY

In 1947, Texas Eastern purchased the War Emergency Pipeline ("WEP") System from the United States Government. The system was constructed between 1942-1944 to deliver petroleum liquids to the northeastern states during World War II. The Rockwood Station was a WEP compressor station. Since Texas Eastern acquired the system, the Site has never operated

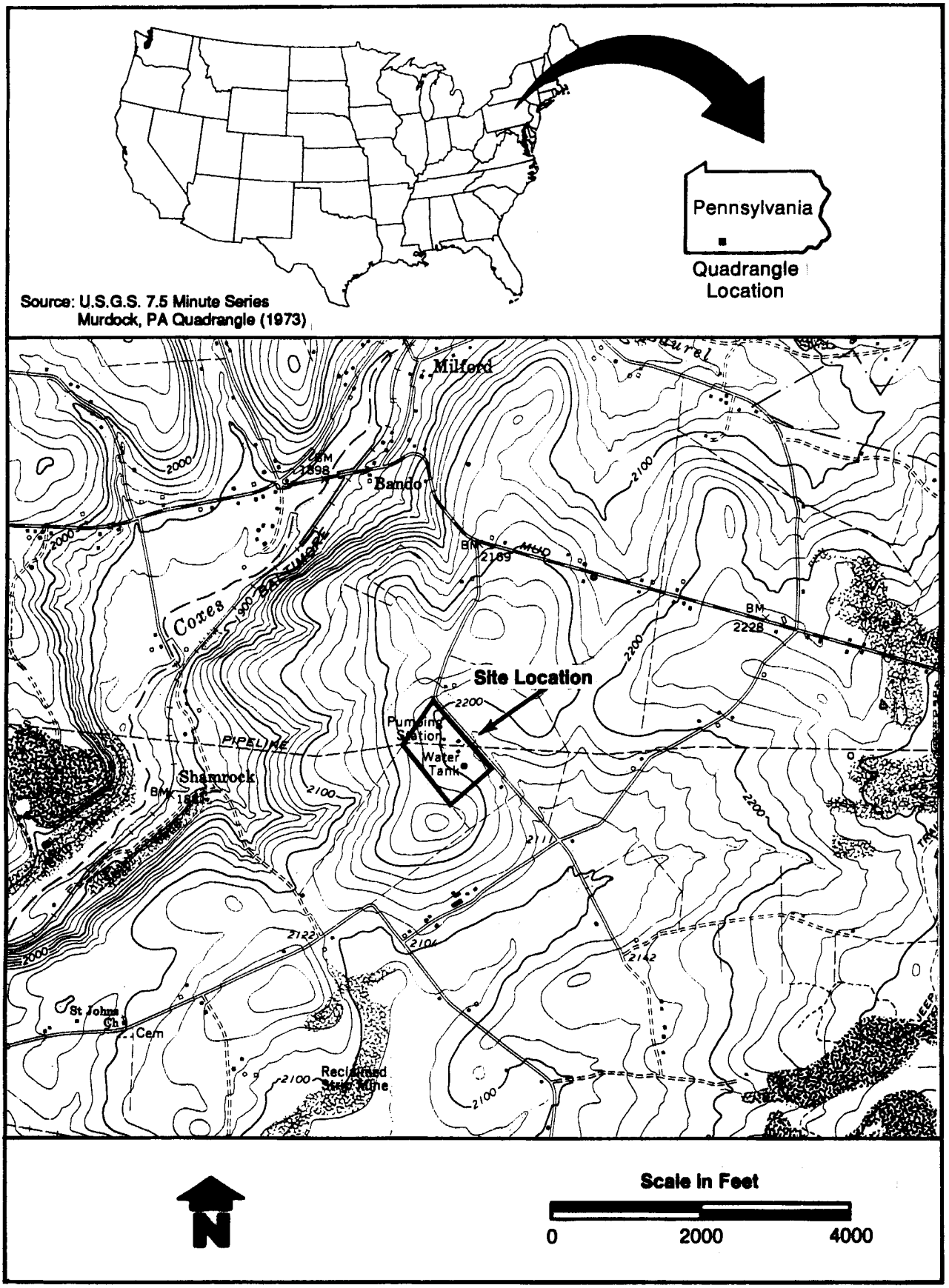

FIGURE 1-2 LOCATION OF THE ROCKWOOD (22) SITE, PENNSYLVANIA

as a compressor station. The former products station building and the crude station building are now used by Texas Eastern for maintenance, storage, and office facilities.

One Earth Disturbance/WEP area, PA-22-01, was located at the Site (Attachment 1). Area PA-22-01 was reported to be approximately 30 feet in diameter and six feet deep and was located about 250 feet east of the former products station building.

1.4 SUBSTANCES OF CONCERN

The initial groundwater samples collected from three Phase I groundwater monitoring wells and spring SP-01 at the Site were analyzed for the list of parameters attached to the Pennsylvania Consent Order as Exhibit C, which includes the full EPA Hazardous Substance List ("HSL") compounds from Appendix A, Attachment A-C, of the Consent Decree. A list of these analytes is included in Appendix A of the IGDR. In five rounds of groundwater sampling, no substances of concern have been detected in the groundwater.

The groundwater monitoring well network and sampling program described in this IGDR were designed to characterize both the hydrogeologic regime and the groundwater quality in the area of WEP Area PA-22-01 based on Texas Eastern's knowledge of historical operating practices at the Site.

SECTION 2

PHYSICAL SETTING

2.1 SURFACE FEATURES AND DRAINAGE

As shown by the map provided in Attachment 1, the Rockwood (22) Site facilities are fully fenced. The Site is drained by a spring-fed stream that originates onsite. This stream flows in an easterly direction and joins with a perennial stream that borders the eastern part of the Site. The perennial stream eventually enters Wilson Creek approximately 1 mile south of the Site.

The 100 year flood plain of Coxes Creek lies approximately 4,500 feet west of the site (FEMA, 1984). Because the distance from the Site to this floodplain is greater than the areal extent mapped for this site, the flood plain is not shown on the overlay map (Attachment 2) as required in Appendix A, Section III of the Consent Decree.

2.2 REGIONAL SOILS AND GEOLOGY

The dominant soils present in the region are members of the Cavode, Wharton, and Rayne-Gilpin soil series (USDA, 1983). The soils of the Cavode and Wharton series are deep, moderately to poorly drained silt loams, formed by weathering of brown shale and siltstone. High or perched water tables are common in the Cavode silt loam from October through May (USDA, 1983). The Rayne-Gilpin soils are deep to moderately deep, well drained silt loams with some elongate and platy fragments of shale and siltstone. These soils are formed by weathering of shale and siltstone.

The region surrounding the Site is underlain by a thick sequence of sedimentary rocks of Pennsylvanian age (Flint, 1965). The sequence includes, in descending order, the Conemaugh, Allegheny and Pottsville Groups. Figure 2-1 presents a geologic map of the Murdock Quadrangle and Attachment 2 shows the geology and soils of the Site.

The Conemaugh Group consists of alternating sandstone, shale, coal and associated underclay, and limestone. The Allegheny Group contains alternating shale, minor coal, and sandstone. There are 13 coal seams in the Allegheny Group, five of which are mineable (Flint, 1965). The mineable seams include the Upper and Lower Freeport, the Upper and Lower Kittanning, and

FIGURE 2-1 GEOLOGIC MAP OF SOMERSET COUNTY AND ROCKWOOD (22) SITE LOCATION

the Brookville coals. These coals are of medium and low volatile bituminous rank and together comprise one of the largest reserves of such coals in the state (Flint, 1965).

The sedimentary rocks of the region have been gently folded into a succession of anticlines and synclines that trend approximately N 30 degrees E. The Site is on the broad west flank of the Negro Mountain anticline where rocks dip gently to the northwest. A local structural high known as the Centerville Dome is located west of the Site. Bedding is nearly horizontal where the west flank of the anticline merges with the eastern extension of the Centerville Dome (Flint, 1965).

Surface evidence of major faulting in the region is not common. Many small faults with displacements ranging from a few inches to a few feet are exposed in several strip mines (Flint, 1965). The faults are low and high angle thrusts, some of which show no displacement below a depth of 15 to 20 feet (Flint, 1965). A small normal fault with a 20-foot vertical displacement crops out along railroad tracks near the town of Rockwood, about 2 miles southwest of the Site (Flint, 1965). Subsidence fractures within the Allegheny Group may be encountered in connection with underground coal and clay mining (Flint, 1956; Booth, 1988).

2.3 REGIONAL HYDROGEOLOGY

In the region surrounding the Site, groundwater occurs in the interstices and secondary openings formed by fractures in the sedimentary rocks. Movement of groundwater is primarily along joints, bedding planes, and other fractures. The highest well yields are obtained from wells that penetrate the sandstones in the Conemaugh, Allegheny, and Pottsville Groups.

The Conemaugh Group is generally a reliable source of small to moderate supplies of groundwater and is among the important water-yielding units in southern Somerset County (Flint, 1965). The median yield of domestic wells within the Conemaugh Group is 5 gallons per minute (gpm). The yields of wells that penetrate the Allegheny Group vary considerably due to the lenticular character of the sandstones (Newport, 1973). Most of the wells in the Allegheny Group penetrate beds of shale, which is the predominant rock type (Lohman, 1938). The median yield of domestic wells within the Allegheny Group is 5 gpm. The sandstones of the Pottsville Group are extensive and permeable, and they are the highest-yielding units in southern Somerset

County. Although high yields can be obtained from wells that penetrate the Pottsville sandstones, the water quality commonly does not meet state drinking water standards because of the presence of iron and hydrogen sulfide (Flint, 1965). The reported yields for domestic wells in the Pottsville Group range from 3 to 7 gpm.

The site-specific geology and hydrogeology defined by the Phase I groundwater investigation are described in Section 4 as part of the Groundwater Assessment.

SECTION 3

SITE GROUNDWATER INVESTIGATION

The Phase I groundwater monitoring program at the Rockwood (22) Site was performed to assess the groundwater quality near WEP Area PA-22-01. In accordance with Paragraph 9 of the Pennsylvania Consent Order, a Phase II groundwater monitoring program was not implemented because PCBs or other HSL compounds were not detected in the groundwater at the Site.

3.1 SUMMARY OF PHASE I

The Phase I groundwater monitoring program began on May 20, 1987, but completion was delayed until October 1987 with the concurrence of Pennsylvania DER. This delay was due to difficulties that occurred when drilling the first groundwater monitoring well at the Site in May 1987, when it was believed that the borehole penetrated a coal mine opening. This borehole was abandoned and grouted to the surface. Subsequent investigations in October 1987 revealed that a soft clay unit was probably penetrated rather than a coal mine opening.

The Phase I objectives were to:

- Assess subsurface geologic conditions.
- Determine direction of groundwater flow.
- Determine groundwater quality upgradient and downgradient of WEP Area PA-22-01.

Activities undertaken to accomplish these objectives included the installation of three groundwater monitoring wells (MW-01, MW-02, and MW-03), measurement of water levels from groundwater monitoring wells, and collection and analysis of water samples from the groundwater monitoring wells and a spring (SP-01) downgradient from WEP Area PA-22-01.

3.1.1 Installation of Groundwater Monitoring Wells

The three groundwater monitoring wells associated with WEP Area PA-22-01 were drilled in October 1987. The locations of these wells were approved by Pennsylvania DER (Figure 3-1). MW-01 was installed upgradient of the pit, and MW-02 and MW-03 were installed as downgradient

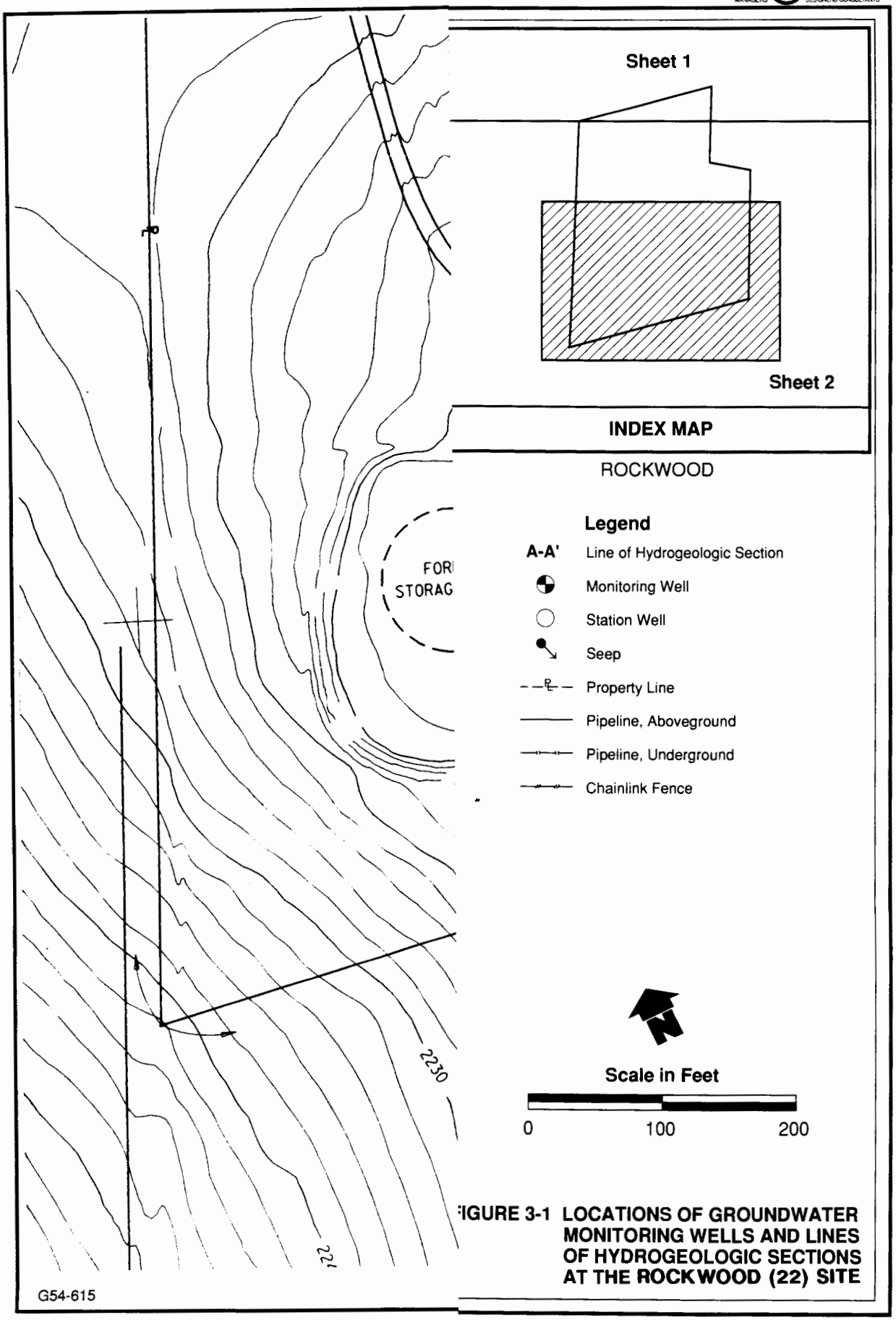

FIGURE 3-1 LOCATIONS OF GROUNDWATER MONITORING WELLS AND LINES OF HYDROGEOLOGIC SECTIONS AT THE ROCKWOOD (22) SITE

wells near the Site property boundary. Two earlier boreholes were drilled at the site of MW-02. However, both were abandoned and grouted to the surface because proper well completion was not possible due to caving of the borehole. A third downgradient monitoring well was not drilled because of property boundary limitations and well spacing constraints, in accordance with an agreement between Texas Eastern and Pennsylvania DER.

The three groundwater monitoring wells at the Site were drilled using hollow stem auger drilling techniques and were completed in accordance with the requirements of the Pennsylvania Consent Order (Exhibit B1, Section A). These groundwater monitoring wells were completed as screened wells in the overburden. Each groundwater monitoring well consists of 4-inch stainless steel casing with 10 feet of No. 10 slot stainless steel screen. A summary of well completion details is shown in Table 3-1. The Pennsylvania Consent Order provided that the wells were to be drilled to a depth such that each would yield water at a rate of at least 5 gpm. Because of low-yielding zones encountered at other Pennsylvania sites, the 5 gpm requirement was waived by an agreement between Texas Eastern and Pennsylvania DER prior to the installation of monitoring wells at the Site. Therefore, wells were completed in the first significant water bearing zone encountered by the well borings.

The drilled depths of the three groundwater monitoring wells associated with WEP Area PA-22-01 ranged from 14 feet at MW-01 to 44 feet at MW-03. A continuous core hole was drilled in bedrock at MW-03 using standard rock coring techniques, and core was obtained from 29 to 44 feet. In accordance with Appendix A, Section IV.C.2 of the Consent Decree, the core is retained onsite for EPA inspection. The depth of the core hole was modified by grouting to a depth of 22 feet, and the borehole was completed in the overburden as a screened well. Lithologic logs of all wells are provided in Appendix B.

After drilling, each groundwater monitoring well was developed by pumping with a submersible pump until the discharge water was clear and sediment-free. The first water level measurements were made after development and stabilization of water levels. Drill cuttings and water produced during drilling and development were collected in drums for proper disposal. After well completion, the location of each groundwater monitoring well was surveyed in terms of site-specific horizontal coordinates. The elevations of the land surface and the top of casing of each groundwater monitoring well were surveyed with respect to a local U.S. Geological Survey Monument. Survey data are presented in Appendix C, Table C-1.

TABLE 3-1

Summary of Well Completion Information,
Rockwood (22) Site, PA

Monitoring Well Number	Date Well Completed	Original Drilled Depth (ft) ***	Overburden Thickness (ft) ***	Open Borehole Or Screen Diameter (in)	Open Interval (ft) *** From	To	Subsurface Water Inflow * Depth(s) (ft) ***	Total Well Yield * (gpm)	Remarks
MW01 **	13-OCT-87	14	13.5	4	3	14	13.5	5.0	
MW02 **	12-OCT-87	19	19	4	7	17.5	7.5 - 10, 17 - 19	5.0	Originally drilled to a depth of 19 feet, the borehole collapsed 1.5 feet.
MW03 **	08-OCT-87	44	29	4	6	22	6 - 10, 20	2.0	Cored interval from 29 to 44 feet. Modified on 8-OCT-87 to a total depth of 22 feet.

* = Estimated at time of drilling.
** = Screened well.
*** = Depths are in feet below land surface.

3.1.2 Groundwater Sampling

The groundwater monitoring wells remained undisturbed for a least seven days after completion to allow groundwater conditions to stabilize prior to groundwater sampling. Approximately three well volumes of water were purged prior to sample collection in order to obtain representative samples of groundwater. Groundwater monitoring wells that were pumped dry during purging were allowed to recover before sampling. Groundwater samples were collected from the groundwater monitoring wells at the Site using dedicated sampling pumps.

Paragraph 11 of the Pennsylvania Consent Order required quarterly sampling of Phase I wells for two years. With the approval of Pennsylvania DER, the quarterly sampling of all groundwater monitoring wells for the Pennsylvania sites was postponed from December 1987 until January 1988 to allow time for the installation of dedicated sampling pumps.

The groundwater monitoring wells were initially sampled on January 19, 1988. Samples were analyzed for all substances listed in Exhibit C of the Pennsylvania Consent Order. After this sampling round, the analytes were limited to PCBs; benzene, toluene, total xylenes, and ethylbenzene (BTXE); and total organic carbon (TOC) by agreement between Texas Eastern and Pennsylvania DER. Groundwater samples were also collected from the downgradient spring, SP-01, beginning in April 1988. The samples collected from the spring in July 1988 were analyzed for all substances listed in Exhibit C of the Pennsylvania Consent Order. Because PCBs were not detected in groundwater at the Site, Texas Eastern and Pennsylvania DER agreed that after April 1988, groundwater sampling would be conducted semi-annually. Additionally, sampling for BTXE was discontinued at the site after the October 1988 sampling round. After five rounds of sampling, through April 1989, Texas Eastern and Pennsylvania DER agreed to annual groundwater sampling commencing in July 1990.

Analytical results of the quarterly samplings of Phase I groundwater monitoring wells and the spring are summarized and discussed in Section 4.

SECTION 4

GROUNDWATER ASSESSMENT

4.1 HYDROGEOLOGIC REGIME

4.1.1 Lithology and Structure

The subsurface geology at the Site was determined from lithologic descriptions of the overburden, drill cuttings, and core samples collected during the drilling of the Phase I groundwater monitoring wells. A general description of the lithologic units encountered during drilling at the Site is summarized in the hydrogeologic section in Figure 4-1.

The thickness of the overburden ranges from 13.5 feet at MW-01 to 29 feet at MW-03. The overburden consists of predominantly yellow brown to gray brown silt and yellow brown or gray to black clay with some sand and rock fragments. This material is underlain by a sequence of highly weathered shale that grades to moderately weathered, friable shale, and highly weathered siltstone, coal, and sandstone of the Allegheny Group (Flint, 1965). A bed of soft underclay was encountered beneath the coal at MW-03. The soft underclay was also penetrated during drilling of the two abandoned boreholes drilled for MW-02.

The Conemaugh Group is not present in the vicinity of the groundwater monitoring wells; however, it directly underlies the hill south of the Site.

The rocks of the Allegheny Group were not observed to crop out in the vicinity of the Site. A review of aerial photographs and the Murdock 7.5 minute series quadrangle map did not reveal the presence of any prominent surface linear features at the Site.

4.1.2 Groundwater Occurrence and Movement

Perennially shallow water levels in all three groundwater monitoring wells indicate that the upper groundwater zone of the WEP Area PA-22-01 consists of the saturated portion of the overburden and the underlying fractured bedrock. The water level data and dates of measurement are summarized in Table 4-1. A groundwater level contour map of the groundwater in the vicinity of WEP Area PA-22-01 was constructed from water level

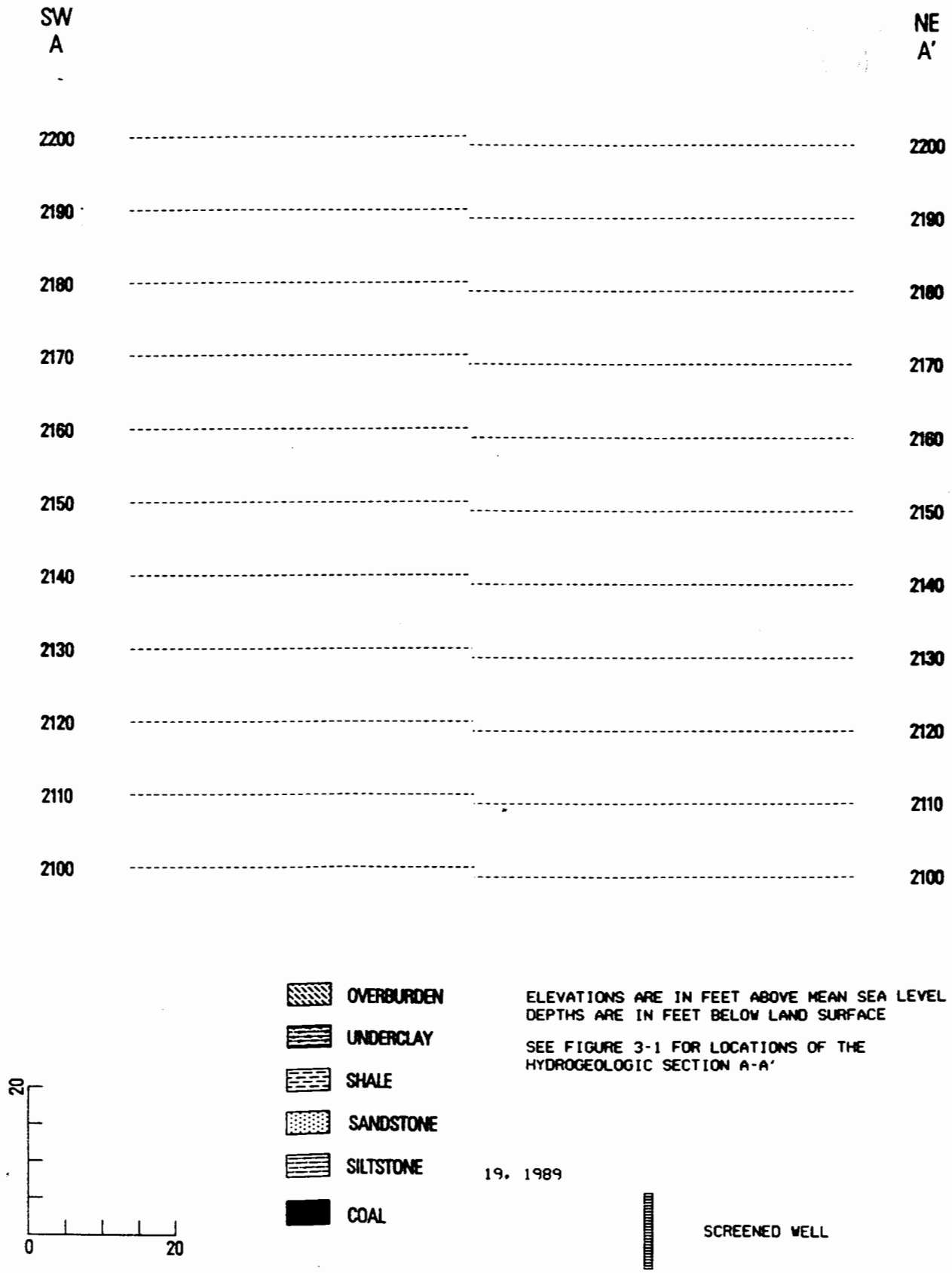

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FIGURE 4-1 HYDROGEOLOGIC SECTION A-A' ROCKWOOD (22) SITE

TABLE 4-1

Summary of Groundwater Level Measurements,
Rockwood (22) Site, PA

Monitoring Well Number	Land Surface Elevation *	Top of Casing Elevation *	Measurement Date	Measured Depth to Water **	Water Level Elevation *
MW01	2186.6	2187.87	14-OCT-87	7.73	2180.14
			19-NOV-87	9.18	2178.69
			19-JAN-88	9.00	2178.87
			07-MAR-88	5.84	2182.03
			18-APR-88	7.53	2180.34
			05-JUL-88	8.32	2179.55
			12-OCT-88	8.83	2179.04
MW02	2179.1	2180.49	13-OCT-87	3.81	2176.68
			14-OCT-87	3.79	2176.70
			19-NOV-87	5.02	2175.47
			19-JAN-88	4.85	2175.64
			07-MAR-88	3.01	2177.48
			18-APR-88	3.69	2176.80
			05-JUL-88	4.99	2175.50
			12-OCT-88	5.86	2174.63
MW03	2177.1	2179.31	13-OCT-87	3.55	2175.76
			14-OCT-87	3.61	2175.70
			19-NOV-87	5.42	2173.89
			19-JAN-88	5.10	2174.21
			07-MAR-88	3.12	2176.19
			18-APR-88	3.72	2175.59
			05-JUL-88	5.53	2173.78
			12-OCT-88	6.00	2173.31

* = Feet above mean sea level.
** = Feet below Top of Casing.

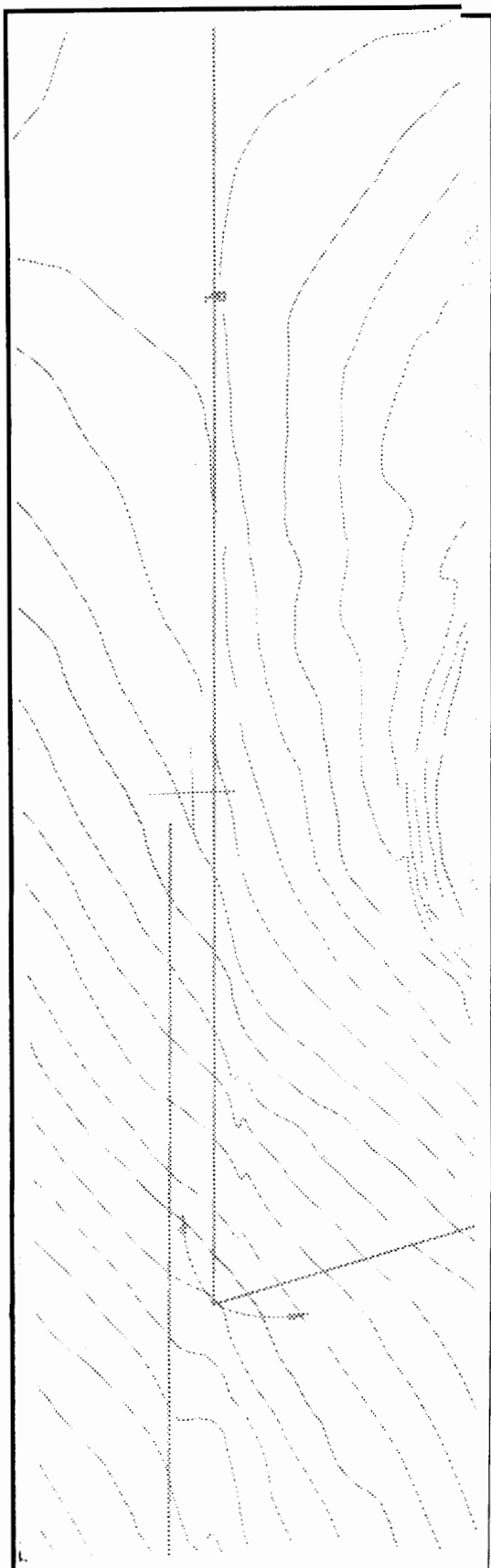
measurements made on October 12, 1988, and indicates that groundwater level contours approximately parallel the topography (Figure 4-2). The direction of groundwater movement near WEP Area PA-22-01 is northeast, toward the lower hydraulic heads in MW-02 and MW-03.

As shown by Figure 4-3, the water level data for the groundwater monitoring wells in the vicinity of WEP Area PA-22-01 show similar patterns of seasonal fluctuation and indicate that the groundwater monitoring wells are hydraulically part of the same groundwater system. The water table represents the surface of groundwater in this system.

The location of spring SP-01 appears to give a good indication of the general groundwater conditions downgradient of WEP Area PA-22-01 (Figure 4-2). Such a spring on a valley side generally indicates a shallow groundwater surface with a shallow circulation of subsurface water in the overburden and weathered bedrock. Spring SP-01 probably represents the same groundwater system as the three monitoring wells.

4.2 CHARACTERIZATION OF GROUNDWATER QUALITY

Groundwater quality analyses for the Site are summarized in Table 4-2. The table provides analytical results for PCBs, BTXE, and TOC. The complete analytical results for groundwater quality analyses are provided by Appendix D of this IGDR and are contained in the Groundwater Quality Data Reports, which were previously submitted to Pennsylvania DER. PCBs and BTXE are the compounds that have been identified by Texas Eastern and Pennsylvania DER as the substances of concern at the Texas Eastern sites in Pennsylvania. As shown in Table 4-2, PCBs and other substances of concern were not detected in the groundwater at the Site during any sampling round. These findings are consistent with non-detection of PCBs in the soil boring samples collected inside WEP Area PA-22-01 and reported in the "Pit Soil Borings and Analysis, Results of the 54 Site Screening Program" (WESTON, 1987).



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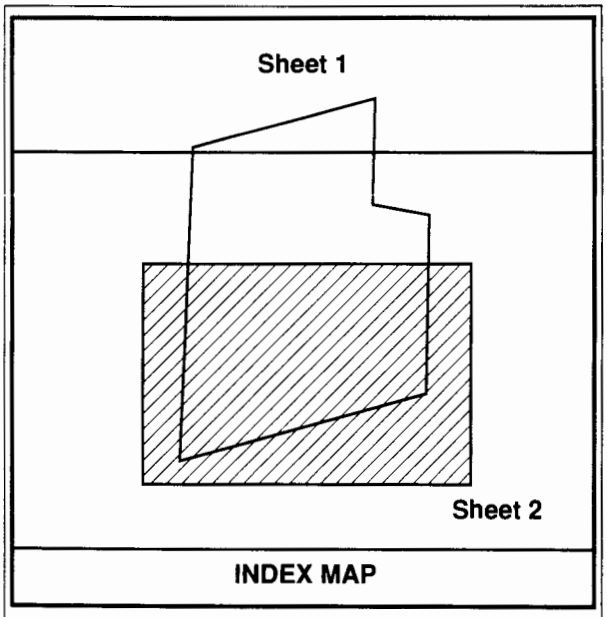

INDEX MAP

ROCKWOOD

Legend

- Monitoring Well and Groundwater Level Elevation (Feet Above MSL)
- Station Well
- Seep
- Property Line
- Pipeline, Aboveground
- Pipeline, Underground
- Chainlink Fence
- 2180 — Groundwater Level Contour

Scale in Feet

0 100 200

FIGURE 4-2 GROUNDWATER LEVEL CONTOUR MAP, ROCKWOOD (22) SITE OCTOBER 12, 1988

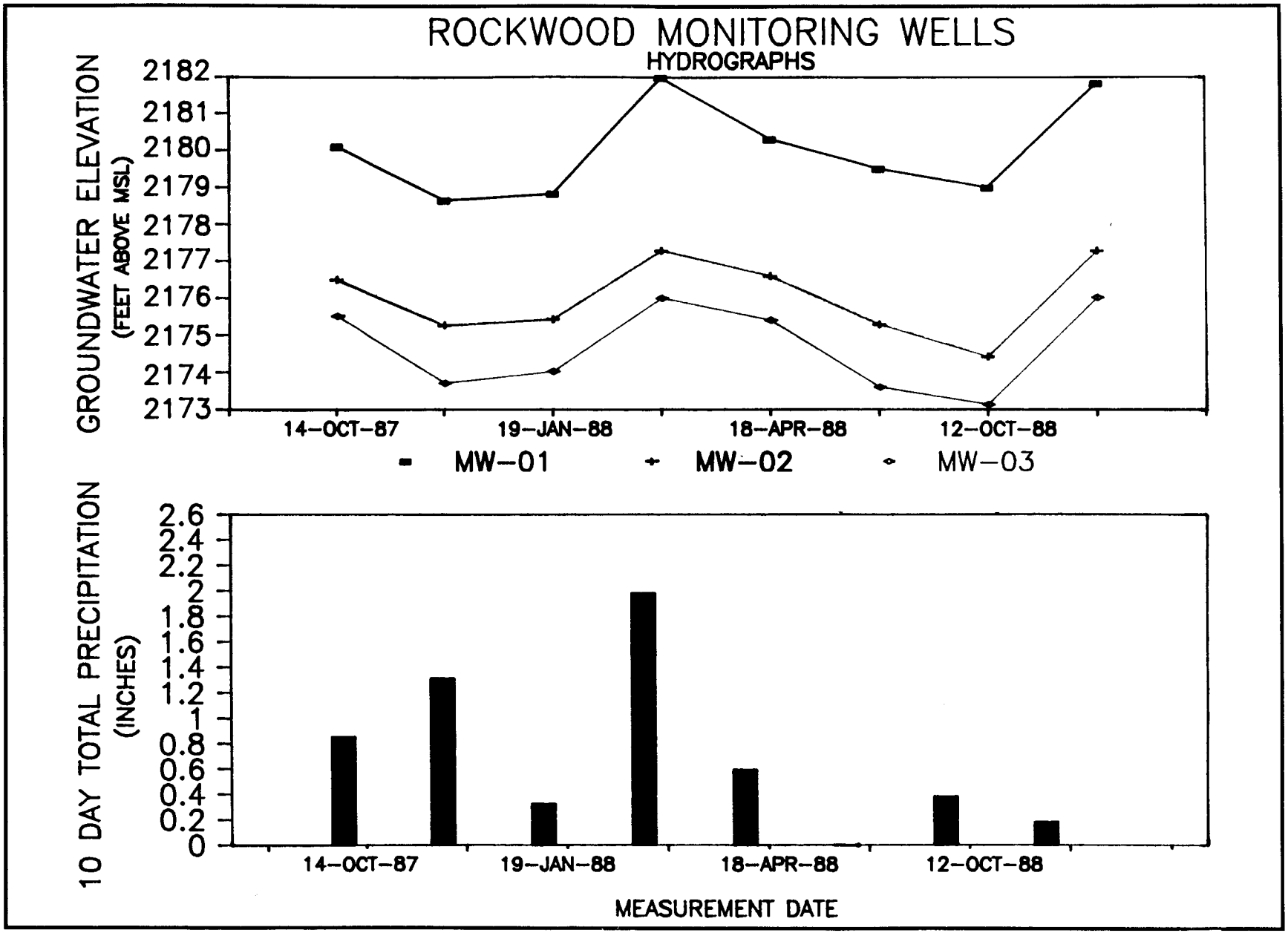

FIGURE 4-3 COMPARISON OF GROUNDWATER ELEVATION FLUCTUATIONS AND 10 DAY TOTAL PRECIPITATION (MW-01, MW-02, MW-03) ROCKWOOD (22) SITE

TABLE 4-2

Summary of Groundwater Analyses,
Rockwood (22) Site, PA

Monitoring Well No. Sampling Date	Sample Number	PCBs 1016 (ug/l)	PCBs 1232 (ug/l)	PCBs 1242 (ug/l)	PCBs 1248 (ug/l)	PCBs 1254 (ug/l)	BTXE Benzene (ug/l)	BTXE Toluene (ug/l)	BTXE Total Xylenes (ug/l)	BTXE Ethyl-benzene (ug/l)	TOC (mg/l)
Quantitation Limit ***		0.5	0.5	0.5	0.5	1.0	5.0	5.0	5.0	5.0	
MW01											
19-JAN-88	A01	NR	NR	NR	NR	NR	ND	ND	ND	ND	1.10
	A01 *	ND	ND	ND	ND	ND					
18-APR-88	B01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.51
05-JUL-88	C01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.87
12-OCT-88	E01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.50
19-APR-89	E01	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
MW02											
19-JAN-88	A01	NR	NR	NR	NR	NR	ND	ND	ND	ND	5.80
	A01 *	ND	ND	ND	ND	ND					
	A02	NR	NR	NR	NR	NR	ND	ND	ND	ND	4.00
	A02 *	ND	ND	ND	ND	ND					
18-APR-88	B01	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.10
05-JUL-88	C01	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.00
12-OCT-88	E01	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.70
19-APR-89	E01	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
MW03											
19-JAN-88	A01	NR	NR	NR	NR	NR	ND	ND	ND	ND	1.70
	A01 *	ND	ND	ND	ND	ND					
18-APR-88	B01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.70
	B02	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.70
	B20	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.72
05-JUL-88	C01	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.90
	C02	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.20
	C20	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
12-OCT-88	E01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54
	E02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54
	E20	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
19-APR-89	E01	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
	E02	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
	E20	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
SP01											
18-APR-88	A01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-2

Summary of Groundwater Analyses,
Rockwood (22) Site, PA
(continued)

Monitoring Well No. Sampling Date	Sample Number	PCBs 1016 (ug/l)	PCBs 1232 (ug/l)	PCBs 1242 (ug/l)	PCBs 1248 (ug/l)	PCBs 1254 (ug/l)	BTXE Benzene (ug/l)	BTXE Toluene (ug/l)	BTXE Total Xylenes (ug/l)	BTXE Ethyl-benzene (ug/l)	TOC (mg/l)
Quantitation Limit ***		0.5	0.5	0.5	0.5	1.0	5.0	5.0	5.0	5.0	
SP01											
05-JUL-88	B01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77
	B02	NR	NR	NR	NR	NR	ND	ND	ND	ND	NR
12-OCT-88	D01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.64
19-APR-89	D01	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
	D30	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR

Note: The Sample Identification Codes are defined in Appendix C (Table C-2).

* = PCB samples were analyzed according to EPA SW-846 method 8080 for Pesticides/PCBs.
(All other PCB samples were analyzed using EPA method 8080, modified for PCBs only.)
** = Results are inconclusive. (Below sample detection limit or present in blank.)
*** = Quantitation limits as defined in Appendix A, Attachment A-C of the Consent Decree.
ND = Not Detected above Consent Decree quantitation limits.
NR = Not Requested to be analyzed.

SECTION 5

SUMMARY AND CONCLUSIONS

Texas Eastern's groundwater assessment activities performed at the Rockwood (22) Site through March 1, 1990, as summarized below, satisfy the requirements and objectives outlined in Appendix A, Section IV, of the Consent Decree.

- A literature review of regional hydrogeology and groundwater usage was conducted pursuant to Appendix A, Section IV.A of the Consent Decree.
- Placement of groundwater monitoring wells in the vicinity of WEP Area PA-22-01, meet the requirements of Section IV.C and Appendix A, Attachment A-A, Paragraph 2.1 of the Consent Decree.
- A continuous bedrock core was collected in the vicinity of WEP Area PA-22-01 and retained on-site for inspection by EPA as required in Appendix A, Section IV.C of the Consent Decree.
- Groundwater monitoring wells installed at the Site were constructed within the guidelines set forth in Appendix A, Attachment A-B of the Consent Decree.
- Groundwater level data has been used to determine the horizontal flow gradients in the uppermost bedrock aquifer as required in Appendix A, Section IV.B of the Consent Decree.
- The initial sample from each well was analyzed for the complete list of HSL compounds listed in Attachment A-C of the Consent Decree. Based on this initial sampling round, subsequent groundwater samples were analyzed for PCBs and BTXE. Because BTXE compounds were not detected above quantitation limits, BTXE analyses were later discontinued.

Based on the groundwater assessment activities described in Sections 3 and 4, the following technical summary and conclusions are presented:

- Perennially shallow water levels in all three groundwater monitoring wells indicate that the upper groundwater zone in the vicinity of WEP Area PA-22-01 consists of the saturated portion of the overburden and the underlying fractured bedrock.
- The water level data obtained for the Site indicate that the groundwater monitoring wells monitor the same groundwater zone.
- In the vicinity of WEP Area PA-22-01, the groundwater flow direction is shown to be toward the northeast, thereby satisfying the requirement of Appendix A, Section IV.C of the Consent Decree.

- No substances of concern have been confirmed in five rounds of samples collected from either the groundwater monitoring wells or the offsite downgradient spring at the Rockwood site. Therefore, with the approval of Pennsylvania DER, no further groundwater sampling has occurred since the fifth round, collected on April 19, 1989.

Future sampling of the spring (SP-01) and groundwater monitoring wells (MW-01, MW-02, and MW-03) at the Rockwood (22) Site will be based upon EPA's review of the Site Sampling Report documents, which were submitted April 11, 1990, and on the procedures outlined in Appendix A, Section IV.C.6.a of the Consent Decree. The Site Sampling Report documents include the following: "Summary Report for the Phase I Surface Soil and Sediment Sampling Program at the Rockwood, Pennsylvania, Site" (WESTON, January 1988) and "Results of the Phase II Surface Soil and Sediment Sampling and Additional Sampling Activities at the Rockwood (22) Site, Pennsylvania" (WESTON, July 1988).

SECTION 6

REFERENCES

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A

APPENDIX A

SUMMARIES OF GROUNDWATER ANALYTICAL PARAMETERS AT THE PENNSYLVANIA SITES REQUIRED BY THE U.S. EPA AND BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES

- ATTACHMENT A-C OF THE CONSENT DECREE
- EXHIBIT C OF THE CONSENT ORDER WITH THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES

ORIGINAL
(Red)

ATTACHMENT A-C OF THE CONSENT DECREE

LIST OF HSL SUBSTANCES

ATTACHMENT A-C

LIST OF HSL SUBSTANCES

I. Organic Compounds A. Volatile Organic Compounds	Quantitation Limit Water (ug/L)
chloromethane	10
bromomethane	10
vinyl chloride	10
chloroethane	10
methylene chloride	5
acetone	10
carbon disulfide	5
1,1-dichloroethene	5
1,1-dichloroethane	5
1,2-dichloroethene (total)	5
chloroform	5
1,2-dichloroethane	5
2-butanone	10
1,1,1-trichloroethane	5
carbon tetrachloride	5
vinyl acetate	10
bromodichloromethane	5
1,1,2,2-tetrachloroethane	5
1,2-dichloropropane	5
cis-1,3-dichloropropene	5
trichloroethene	5

Comment: This Attachment A-C listing, consisting of 152 compounds, comprises the CERCLA hazardous substance list (HSL). This list is applicable for the duration of the Consent Decree in lieu of the more recent, and lengthy, RCRA Appendix VIII (and IX) listing of 250 compounds.

A. Volatile Organic Compounds (cont'd)	Quantitation Limit Water (ug/L)
dibromochloromethane	5
1,1,2-trichloroethane	5
benzene	5
trans-1,3-dichloropropene	5
bromoform	5
4-methyl-2-pentanone	10
2-hexanone	10
tetrachloroethene	5
toluene	5
chlorobenzene	5
ethyl benzene	5
styrene	5
total xylenes	5

B. Semi-Volatile Organic Compounds	
phenol	10
bis(2-chloroethyl) ether	10
2-chlorophenol	10
1,3-dichlorobenzene	10
1,4-dichlorobenzene	10
benzyl alcohol	10
1,2-dichlorobenzene	10

B. Semi-Volatile Organic Compounds(cont'd)	Quantitation Limit Water (ug/L)
2-methylphenol	10
bis(2-chloro-isopropyl)ether	10
4-methylphenol	10
N-nitroso-di-n-dipropylamine	10
hexachloroethane	10
nitrobenzene	10
isophorone	10
2-nitrophenol	10
2,4-dimethylphenol	10
benzoic acid	50
bis(2-chloroethoxy)methane	10
2,4-dichlorophenol	10
1,2,4-trichlorobenzene	10
naphthalene	10
4-chloroaniline	10
hexachlorobutadiene	10
3,3'-dichlorobenzidine	20
4-chloro-3-methylphenol	10
2-methylnaphthalene	10
hexachlorocyclopentadiene	10
2,4,6-trichlorophenol	10
2,4,5-trichlorophenol	50
2-chloronaphthalene	10

B. Semi-Volatile Organic Compounds (cont'd)	Quantitation Limit Water (ug/L)
2-nitroaniline	50
dimethylphthalate	10
acenaphthylene	10
3-nitroaniline	50
acenaphthene	10
2,4-dinitrophenol	50
4-nitrophenol	50
dibenzofuran	10
2,4-dinitrotoluene	10
2,6-dinitrotoluene	10
diethylphthalate	10
4-chloro-phenylphenyl ether	10
fluorene	10
4-nitroaniline	50
4,6-dinitro-2-methylphenol	50
N-nitrosodiphenylamine	10
4-bromophenyl-phenyl ether	10
hexachlorobenzene	10
pentachlorophenol	50
phenanthrene	10
anthracene	10
di-n-butylphthalate	10
fluoranthene	10
pyrene	10

B. Semi-Volatile Organic Compounds (cont'd)	Quantitation Limit Water (ug/L)
butylbenzylphthalate	10
benzo(a)anthracene	10
bis(2-ethylhexyl)phthalate	10
chrysene	10
di-n-octylphthalate	10
benzo(b)fluoranthene	10
benzo(k)fluoranthene	10
benzo(a)pyrene	10
indeno(1,2,3-cd)pyrene	10
dibenz(a,h)anthracene	10
benzo(g,h,i)perylene	10

C. Pesticides/PCBs	
alpha-BHC	0.05
beta-BHC	0.05
delta-BHC	0.05
gamma-BHC(Lindane)	0.05
heptachlor	0.05
aldrin	0.05
heptachlor epoxide	0.05
endosulfan I	0.05
dieldrin	0.10
4,4'-DDE	0.10

C. Pesticides/PCBs (Cont'd)	Quantitation Limit Water (ug/L)	
endrin	0.10	
endosulfan II	0.10	
4,4'-DDD	0.10	
endosulfan sulfate	0.10	
4,4'-DDT	0.10	
endrin ketone	0.10	
methoxychlor	0.5	
alpha-chlordane	0.5	
gamma chlordane	0.5	
toxaphene	1.0	
Aroclor 1016	0.5	
Aroclor 1221	0.5	
Aroclor 1232	0.5	
Aroclor 1242	0.5	
Aroclor 1248	0.5	
Aroclor 1254	1.0	
Aroclor 1260	1.0	
D. Inorganic Substances		
Aluminum	200	
Antimony	60	
Arsenic	10	(50)*

D. Inorganic Substances (Cont'd)	Quantitation Limit Water (ug/L)	
Barium	200	(1000)*
Beryllium	5	
Cadmium	5	(10)*
Calcium	5000	
Chromium	10	(50)*
Cobalt	50	
Copper	25	
Cyanide	10	
Iron	100	
Lead	5	(50*)
Magnesium	5000	
Manganese	15	
Mercury	0.2	(2)*
Nickel	40	
Potassium	5000	
Selenium	5	(10)*
Silver	10	(50)*
Sodium	5000	
Thallium	10	
Vanadium	50	
Zinc	20	

*Concentration level (ug/L) referenced in last line of Section IV.E.1.

EXHIBIT C OF THE CONSENT ORDER WITH THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES

LIST OF HSL SUBSTANCES AND OTHER PARAMETERS

EXHIBIT C

Organic HSL Substances

chloromethane
bromomethane
vinyl chloride
chloroethane
methylene chloride
acetone
carbon disulfide
1,1-dichloroethene
1,1-dichloroethane
trans-1,2-dichloroethene
chloroform
1,2-dichloroethane
2-butanone
1,1,1-trichloroethane
carbon tetrachloride
vinyl acetate
bromodichloromethane
1,1,2,2-tetrachloroethane
1,2-dichloropropane
trans-1,3-dichloropropene
trichloroethene
dibromochloromethane
1,1,2-trichloroethane
benzene
cis-1,3-dichloropropene
2-chloroethyl vinyl ether
bromoform
4-methyl-2-pentanone
2-hexanone
tetrachloroethene
toluene
chlorobenzene
ethylbenzene
styrene
total xylenes
phenol
bis(2-chloroethyl)ether
2-chlorophenol
1,3-dichlorobenzene
1,4-dichlorobenzene
benzyl alcohol
1,2-dichlorobenzene
2-methylphenol
bis(2-chloroisopropyl)ether
4-methylphenol
N-nitroso-dipropylamine
hexachloroethane

nitrobenzene
isophorone
2-nitrophenol
2,4-dimethylphenol
benzoic acid
bis(2-chloroethoxy) methane
2,4-dichlorophenol
1,2,4-trichlorobenzene
naphthalene
4-chloroaniline
hexachlorobutadiene
3,3-dichlorobenzidine
4-chloro-3-methylphenol
(para-chloro-meta-cresol)
2-methylnaphthalene
hexachlorocyclopentadiene
2,4,6-trichlorophenol
2,4,5-trichlorophenol
2-chloronaphthalene
2-nitroaniline
dimethyl phthalate
acenaphthylene
3-nitroaniline
acenaphthene
2,4-dinitrophenol
4-nitrophenol
dibenzofuran
2,4-dinitrotoluene
2,6-dinitrotoluene
diethyl phthalate
4-chlorophenyl phenyl ether
fluorene
4-nitroaniline
4,6-dinitro-2-methylphenol
N-nitrosodiphenylamine
4-bromophenyl phenyl ether
hexachlorobenzene
pentachlorophenol
phenanthrene
anthracene
di-n-butylphthalate
fluoranthene
pyrene
butyl benzyl phthalate
benzo(a)anthracene
bis(2-ethylhexyl)phthalate
chrysene
di-n-octyl phthalate
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(a)pyrene
indeno(1,2,3-cd)pyrene
dibenz(a,h)anthracene
benzo(g,h,i)perylene

alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (lindane)
heptachlor
aldrin
heptachlor epoxide
endosulfan I
dieldrin
4,4'-DDE
endrin
endosulfan II
4,4'-DDD
endrin aldehyde
endosulfan sulfate
4,4'-DDT
endrin ketone
methoxychlor
chlordane
toxaphene
aroclor 1016
aroclor 1221
aroclor 1232
aroclor 1242
aroclor 1248
aroclor 1254
aroclor 1260

Inorganic HSL Substances

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Calcium
Chromium
Cobalt
Copper
Cyanide
Iron
Lead
Magnesium
Manganese
Mercury
Nickel
Potassium
Selenium
Silver
Sodium
Thallium
Vanadium
Zinc

Other Parameters

Total fluoride in milligrams/liter
Nitrate nitrogen in milligrams/liter
Turbidity in nephelometric turbidity units
Total organic carbon in milligrams/liter
total chloride in milligrams/liter
pH
Specific conductance in micromhos/centimeter
Total sulphate in milligrams/liter